

Amendments to the Specification:

Please amend the specification as follows:

Pages 4-5, "Brief Description of the Drawings"

FIG. 1A is a perspective view showing a reforming catalyst according to an embodiment of the present invention, in which catalyst composition is coated on respective inner walls of a monolithic substrate;

FIG. 1B is an enlarged sectional view showing a cell of the monolithic substrate shown in FIG. 1A;

FIG. 2 is a perspective view showing a reactor containing the reforming catalyst;

FIG. 3 is a block diagram showing a configuration of an example of a fuel cell system employing the reforming catalyst according to the embodiment of the present invention;

FIG. 4 is a view showing a configuration of SOFC (Solid Oxide Electrolyte Fuel Cell) employing the electrode catalyst reforming catalyst according to the embodiment of the present invention; and

FIGS. 5A and 5B showing an evaluation system employed to execute the evaluation of the reforming catalyst in Examples and Comparative examples respectively.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Page 14, paragraph beginning on line 17:

Example #1

In Example 1, the nitrates of respective elements were mixed to get La:0.9 mol, Sm:0.1 mol, Gd:0.95 mol, and Ru:0.05 mol. That is, as shown in Table 1, the lanthanum nitrate $[\text{La}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}]$ of 389.7 g, the gadolinium nitrate $[\text{Gd}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}]$ of 428.5 g, the samarium nitrate $[\text{Sm}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}]$ of 44.4 g, and the ruthenium nitrate solution $[\text{Ru}(\text{NO}_3)_2 \text{ solution} \cdot \text{Ru concentration } 3.6 \text{ wt } \%]$ of 140.4 g were weighed respectively, and then they were mixed with the pure water 1 L and then sufficiently stirred.

Page 15, paragraph beginning on line 19:

As given in Table 2, amounts of respective elements per this forming catalyst A unit were La:4.25 g, Gd:5.19 g, Sm:0.52 g, and Ru:0.15 g. Also, as given in Table 3, the composition of the reforming catalyst was $\text{La}_{0.9}\text{Sm}_{0.1}\text{Gd}_{0.95}\text{Ru}_{0.05}\text{O}_3$. That is, the catalyst A in Example 1 was the reforming catalyst which was the perovskite composite oxide expressed by $\text{A}'1-\text{xA}''\text{xB}'1-\text{yB}''\text{yO}_3$ and contains the catalyst composition having La on the A' site, Sm on the A'' site, Gd on the B' site, and Ru on the B'' site. As given in Table 3, an amount of remaining methanol by this catalyst A was 0.98% and the reformation rate was 99.02%, both detected under the test conditions described later.

Page 15, last full paragraph:

In Examples 2 to 17, the catalyst B to the catalyst Q were formed by using the manufacturing method similar to Example 1, while changing catalyst composition ratios in compliance with the compositions given in Table 1. The compositions of respective catalyst and the remaining methanol amount and the reform rate of respective catalysts, which were detected under the test conditions described later, are given in Table 3.

Page 16, second full paragraph:

First, the mixed solution was prepared by mixing La:0.8 mol, Sm:0.2 mol, and Gd:0.9 mol, i.e., the lanthanum nitrate 346.6 g, the samarium nitrate 88.9 g, and the gadolinium nitrate 428.5 g into the pure water 1 L, as shown in Table 1, and then stirring sufficiently them.

Page 17, paragraph beginning on line 19:

Comparative Example # 2

The catalyst Y was obtained by preparing the slurry by using the perovskite composite oxide powders obtained in Comparative Example 1, then coating it on the ceramic monolithic substrate, and baking it at 400 °C. That is, Comparative Example 2 was different from Comparative Example 1 in that the catalyst Y was not impregnated with the catalyst activating substance Ru. As given in Table 3, an amount of remaining methanol by this

catalyst Y was 3.62% and the reformation rate was 96.36%, both were detected under the test conditions described later.

Page 18, paragraph beginning on line 3:

In Examples 19 and 20, the electrode catalysts (b) (c) were produced by using the compositions of the perovskite composite oxide powders given in Table 4 under the same conditions as Example 18.

Page 19, paragraph beginning on line 3:

The reforming temperature was set to 400 °C. at the catalyst inlet temperature, and LHSV (value of the supply liquid amount to the catalyst volume per unit time) was set to 2 hr⁻¹. The results are given in Table 3.

Page 20, paragraph beginning on line 4:

The results are given in Table 4.

Page 21, following the last paragraph, please insert the following tables:

Table.1

Example No.	La-nitrate (g)	Pr-nitrate (g)	Gd-nitrate (g)	Ce-nitrate (g)	Sm-nitrate (g)	Fe-nitrate (g)	Ru-nitrate (3.6wt% solution)	Rh-nitrate (8.5wt% solution)	Pd-nitrate (8.5wt% solution)	Pt-nitrate (8.5wt% solution)
example 1	389.7	-	428.5	-	44.4	-	140.4	-	-	-
example 2	346.4	-	428.5	-	88.8	-	140.4	-	-	-
example 3	-	-	428.5	390.6	44.4	-	140.4	-	-	-
example 4	389.7	43.5	-	-	-	323.2	-	240	-	-
example 5	346.4	87.0	-	-	-	323.2	-	240	-	-
example 6	303.1	130.5	-	-	-	323.2	-	240	-	-
example 7	346.4	87.0	-	-	-	202	-	605	-	-
example 8	346.4	87.0	-	-	-	80.8	-	968	-	-
example 9	389.7	43.5	-	-	-	323.2	561.7	-	-	-
example 10	346.4	87.0	-	-	-	323.2	561.7	-	-	-
example 11	303.1	130.5	-	-	-	323.2	561.7	-	-	-
example 12	346.4	87.0	-	-	-	202	1404	-	-	-
example 13	346.4	87.0	-	-	-	80.8	2247	-	-	-
example 14	-	-	360.8	347.2	88.9	-	561.7	-	-	-
example 15	-	-	360.8	347.2	88.9	-	-	240	-	-
example 16	346.4	87.0	-	-	-	80.8	-	-	1127	-
example 17	346.4	87.0	-	-	-	80.8	-	-	-	1835
Comparative example 1	389.7	-	428.5	-	44.4	-	140.4	-	-	-
Comparative example 2	389.7	-	428.5	-	44.4	-	-	-	-	-

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Table.2

Example No.	Catalyst	Amount of each element per a catalyst unit										
		La (g)	Pr (g)	Gd (g)	Ce (g)	Sm (g)	Fe (g)	Ru (g)	Rh (g)	Pd (g)	Pt (g)	
example 1	A	4.25	-	5.19	-	0.52	-	0.15	-	-	-	
example 2	B	3.74	-	5.19	-	1.03	-	0.15	-	-	-	
example 3	C	-	-	5.19	4.08	1.03	-	0.15	-	-	-	
example 4	D	6.16	0.69	-	-	-	1.81	-	0.96	-	-	
example 5	E	5.47	1.38	-	-	-	1.81	-	0.96	-	-	
example 6	F	4.79	2.07	-	-	-	1.81	-	0.96	-	-	
example 7	G	5.47	1.38	-	-	-	1.07	-	2.29	-	-	
example 8	H	5.47	1.38	-	-	-	0.39	-	3.39	-	-	
example 9	I	6.16	0.69	-	-	-	1.81	0.90	-	-	-	
example 10	J	5.47	1.38	-	-	-	1.81	0.90	-	-	-	
example 11	K	4.79	2.07	-	-	-	1.81	0.90	-	-	-	
example 12	L	5.47	1.38	-	-	-	1.07	2.11	-	-	-	
example 13	M	5.47	1.38	-	-	-	0.39	3.14	-	-	-	
example 14	N	-	-	4.49	3.72	1.06	-	0.62	-	-	-	
example 15	O	-	-	4.49	3.72	1.06	-	-	0.70	-	-	
example 16	P	5.47	1.38	-	-	-	0.39	-	-	2.88	-	
example 17	Q	5.47	1.38	-	-	-	0.39	-	-	-	4.68	
Comparative example 1	X	4.25	-	5.19	-	0.52	-	0.15	-	-	-	
Comparative example 2	Y	4.25	-	5.19	-	0.52	-	-	-	-	-	

Table.3

Example No.	Catalyst	Catalyst composition	Amount of remaining MeOH (%)	Reformation rate (%)
example 1	A	La _{0.9} Sm _{0.1} Gd _{0.95} Ru _{0.05} O ₃	0.98	99.02
example 2	B	La _{0.8} Sm _{0.2} Gd _{0.95} Ru _{0.05} O ₃	0.96	99.04
example 3	C	Ce _{0.9} Sm _{0.1} Gd _{0.95} Ru _{0.05} O ₃	1.02	98.98
example 4	D	La _{0.9} Pr _{0.1} Fe _{0.8} Rh _{0.2} O ₃	0.54	99.46
example 5	E	La _{0.8} Pr _{0.2} Fe _{0.8} Rh _{0.2} O ₃	0.48	99.52
example 6	F	La _{0.7} Pr _{0.3} Fe _{0.8} Rh _{0.2} O ₃	0.40	99.60
example 7	G	La _{0.8} Pr _{0.2} Fe _{0.5} Rh _{0.5} O ₃	0.37	99.63
example 8	H	La _{0.8} Pr _{0.2} Fe _{0.2} Rh _{0.8} O ₃	0.23	99.77
example 9	I	La _{0.9} Pr _{0.1} Fe _{0.8} Ru _{0.2} O ₃	0.72	99.28
example 10	J	La _{0.8} Pr _{0.2} Fe _{0.8} Ru _{0.2} O ₃	0.68	99.32
example 11	K	La _{0.7} Pr _{0.3} Fe _{0.8} Ru _{0.2} O ₃	0.51	99.49
example 12	L	La _{0.8} Pr _{0.2} Fe _{0.5} Ru _{0.5} O ₃	0.46	99.54
example 13	M	La _{0.8} Pr _{0.2} Fe _{0.2} Ru _{0.8} O ₃	0.38	99.62
example 14	N	Ce _{0.8} Sm _{0.2} Gd _{0.8} Ru _{0.2} O ₃	0.65	99.35
example 15	O	Ce _{0.8} Sm _{0.2} Gd _{0.8} Rh _{0.2} O ₃	0.53	99.47
example 16	P	La _{0.8} Pr _{0.2} Fe _{0.2} Pd _{0.8} O ₃	0.37	99.63
example 17	Q	La _{0.8} Pr _{0.2} Fe _{0.2} Pt _{0.8} O ₃	0.40	99.60
Comparative example 1	X	La _{0.9} Sm _{0.1} Gd _{0.95} O ₃ / Ru [*]	2.62	97.38
Comparative example 2	Y	La _{0.9} Sm _{0.1} Gd _{0.95} O ₃	3.64	96.36

* The Ru is impregnated into the perovskite composite oxide.

Table.4

Example No.	Composition of electrode-catalyst	Electrode- catalyst	Temperature of starting operation T _{ne} (°C)
example 18	La _{0.8} Pr _{0.2} Fe _{0.8} Rh _{0.2} O ₃	a	420
example 19	La _{0.8} Pr _{0.2} Fe _{0.5} Rh _{0.5} O ₃	b	405
example 20	La _{0.8} Pr _{0.2} Fe _{0.2} Rh _{0.8} O ₃	c	387
Comparative example 3	La _{0.8} Pr _{0.2} Fe _{0.8} O ₃	z	650